CONSIDERING A RESEARCH CAREER? OPTIONS, CHALLENGES, FACTS, AND ADVISE

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WHY A RESEARCH JOB?

- Want to shape the future of the field
- Want to choose what to work on
- Want to stay in academia and teach as well as do research
- Continuing to do research sounds like the right thing/best thing/only thing to do after a Ph.D.

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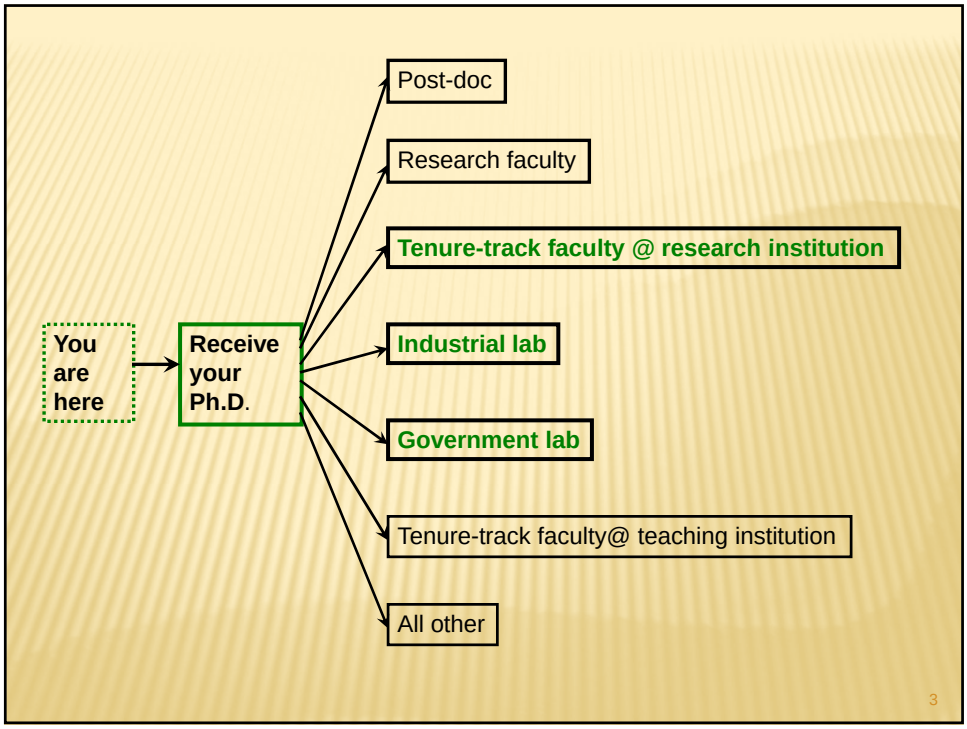

ACADEMIC RESEARCH INSTITUTION

- Start as an Assistant Professor
  - Job security after tenure
- Main expectations
  - Establish an independent research program
  - Publish in conferences and journals
  - Obtain external funding
  - Teach and work with students
  - Service (department, professional, university)

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INDUSTRIAL RESEARCH LABS

- Expect to work on problems relevant to the company
  - real world problems
  - access to real data sets
- Generally no funding pressure
  - securing funds for travel etc. may require effort
- Patents often more important than papers
  - not all work may be published
- Yearly evaluation includes your value to the company
- Not a stable environment in the longer term

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GOVERNMENT LABS

Research focus based on perceived benefit to nation

- Basic research (LBNL, NASA, NOAA, NREL, etc.)
  - Global warming, alternative energy, disease cures, basic science research, space exploration
  - Non-profit mentality
  - Open research environment, international community
- Weapons labs (LLNL, Sandia, LANL, ORNL, etc.)
  - May need security clearance or US citizenship
  - Projects of national importance may have considerable funding
  - High level of security (limited ability to publish)

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COMPARISONS

←----------Lower to higher ----------→

- Pay
  - Pre-tenure academia, govt labs, industry & tenured academia
- Job security
  - Industry, government, academia
- Research freedom
  - Industry, government, academia
- Funding and amenities
  - Unclassified govt labs, academia, weapons labs, industry

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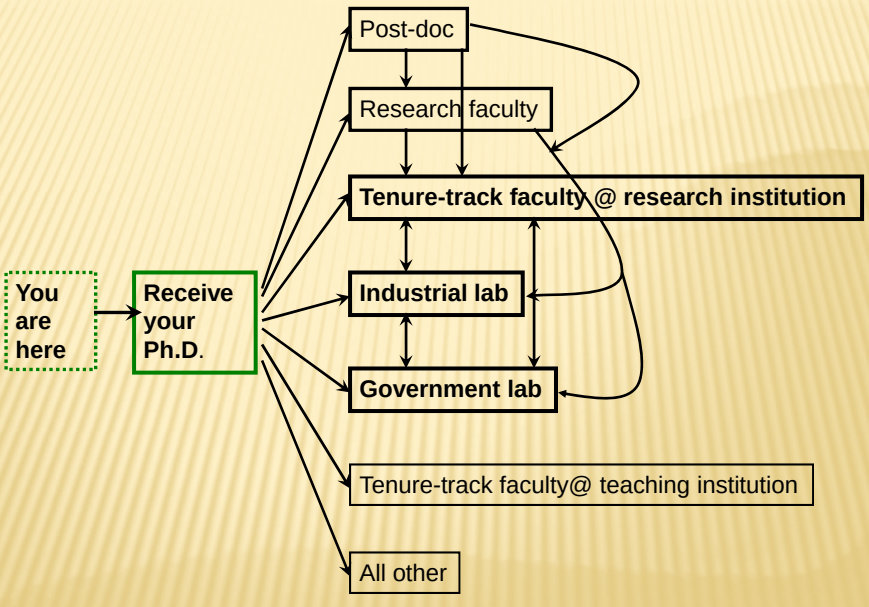

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POST-DOC/RESEARCH FACULTY

- Post-doc
  - supported from a faculty's research grant
  - post-doc fellowships from funding agencies or professional organizations (NSF, ONR, CRA)
- Research faculty
  - secure their own funding ("soft money")
  - academic rank promotion possible in some institutions
  - may or may not involve teaching

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TEACHING POSITIONS

- Undergraduate institutions
  - Top rated liberal arts colleges have excellent students
  - Hiring standards and expectations often very high
- Institutions with no major Ph.D. program
  - Have higher teaching load
  - Expect faculty to be research active

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DO'S (1)

- Have ambitious goal
- Have a broad research plan
- Know when to give up and pursue another idea
- Publish
- Collaborate and publish
- Pursue submissions to conferences and journals
- Attend conferences
  - Start with regional events
  - Explore various funding options
- Improve your communication and writing skills

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DO'S (2)

- Take advantage of opportunities
  - Mentoring, applying for fellowships, etc
- Get used to rejection
  - rejection is part of professional life
- Get help and ask for advice
  - figure out what will work for you
- Network
- Get to know the researchers in your area
  - Senior researchers are often more accessible
- Follow faculty hiring in the department

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DO'S (3)

- Have a professional webpage
- Act in a professional way
- Know the relevant professional organizations and what they can do for you
  - ACM, CRA, IEEE, Special Interest Groups
- **Realize that your first job you take may be the most crucial one**

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DON'TS

- Don’t rush and graduate with the minimum
- Don’t plan out every detail of your research or your career path
- Don’t be a complainer/whiner

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ACADEMIC DECISIONS

Research University or Teaching College?

- Do you like teaching? Research? Both?
- Would you be more comfortable in a big department or a small one?
- Do you want to work primarily with graduate students? Undergraduates?
- What is your risk tolerance?
- How important is salary? Location?

INDUSTRY/GOVERNMENT DECISIONS

Industry, unclassified or classified gov't lab?

- Do you prefer to set your own research direction or work with a large project?
- Would you be more comfortable in a big department or a small one?
- How important is the opportunity to publish (vs. keeping your discoveries proprietary or classified?)
- Would you be willing to modify your research direction based on availability of funding?
- What is your risk tolerance?
- How important is salary? Location?

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PURSUE A POSTDOC POSITION?

- Taking a post-doc position is becoming more common in CS (standard in other fields)
- Funding opportunities exist
  - NSF, ONR, …
  - CRA's CI Fellows program
  - Industry and government labs
  - Well funded research groups (often no official ads)
  - A significant number have citizenship requirements (but not at unclassified gov't labs)

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WHAT IS OFTEN *NOT* SAID

About teaching oriented institutions

- Many expect faculty to have a research program
- Pay is poor compared to University and Industrial positions
- Teaching loads are high (and no grad TAs)
- Teaching positions at research universities might pay better and have a lower teaching load
  - usually little status and often a year-by-year contract

WHAT IS OFTEN *NOT* SAID

- Most departments hire junior faculty expecting to award tenure
  - Hiring and mentoring of junior faculty is expensive, in time and money
  - Making a hire is a big investment for a department
  - Their goal is to hire people who will be successful

WHAT IS OFTEN *NOT* SAID

About government labs and soft money

- Most gov't labs hire expecting/hoping to keep you until retirement
- Making a hire is a big investment for a lab
  - Want people who will be successful team players
- Bringing in your own funding gives you independence and status

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WHAT DEPARTMENTS ARE LOOKING FOR

- Research university metrics
  - Papers in top conferences, some journal papers and submissions
  - Great letters (esp. strong advisor support)
  - Good department fit (neither too many in your research area or no one)
- Teaching college metrics
  - Papers in conferences
  - Teaching enthusiasm and experience
  - Understanding of teaching institutions
- Factors out of your control
  - Number of slots, desirable areas, who else applied/is interviewed, etc

WHAT LABS ARE LOOKING FOR

- Unclassified government lab metrics
  - Good fit with existing funding program
  - Easy to work with and flexible: willing to work on existing lab projects, good software developer
  - Good publication record, great letters (esp. from lab internships)
- Classified government lab metrics
  - Able to obtain security clearance, comfortable in secure environments with many restrictions
  - Willing to work on lab mission within large projects, good software developer
- Industry lab metrics
  - Good fit with company mission, easy to work with and flexible, smart

QUESTIONS?